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REPORT OF THE PRESIDENT  
OF THE  
SOUTH DAKOTA  
AGRICULTURAL COLLEGE



AND THE  
DIRECTOR

OF THE

gricultural Experiment  
Station

FOR THE YEAR ENDED JUNE 30, 1904

red by Act of Congress, Aug. 30, 1890

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# REPORT

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*To the Secretary of the Interior and the Secretary of Agriculture:*

GENTLEMEN: As required by Act of Congress, August 30th, 1890, I have the honor to submit to you the annual report of the South Dakota Agricultural College for the year ended June 30th, 1904.

## ATTENDANCE.

The total registration for the year 1902-1903 was 469; and for the year 1903-1904 the registration was 519. This shows for last year an increased attendance of fifty students over the enrollment of the previous year. This is a gratifying gain for one year and may justly be regarded as a substantial evidence of the continued confidence of the people of the state in the work and usefulness of the Agricultural College.

## CHANGES IN THE FACULTY.

There was but one change in the faculty at the close of the last college year. Miss Lucy A. DuBois, who for many years had filled with great acceptance the chair of Latin and the office of preceptress, resigned to accept a position in Los Angeles. To fill this vacancy Professor R. B. McClenon of Huron, a graduate of Williams College, for fifteen years a prominent educator of this state, at present the president of the South Dakota Educational Association, was elected professor of Latin and pedagogy. The pedagogy is added to meet the growing demand throughout the country for teachers qualified to give instruction in agriculture. It is proper that the Agricultural College should be expected to supply this demand.

The Faculty of the Agricultural College is made up of the heads of departments. It is a strong, well-equipped and thoroughly devoted body of teachers, each a specialist and a recog-

nized authority in his line. A large proportion of its members have been connected with the College for many years and several almost from the organization of the college.

In the minor positions, instructors and assistants, there have been several changes. Such changes are inevitable. The reason is that the best prepared and brightest graduates of our own college are usually selected to fill these subordinate positions at nominal salaries. By their good work they make a reputation for themselves which leads to their discovery by other colleges and universities which offer them salaries sometimes double or treble what they receive here. Of course the college cannot stand in the way of their promotion.

#### **COURSES OF STUDY.**

The courses of study at the college have undergone some modifications during the past year, the purpose of these modifications being to place greater emphasis upon the side of industrial education especially along agricultural lines; to secure a more logical and pedagogical sequence of studies so that subjects shall be taken in their proper order; and to prepare the way for the encouragement of a larger proportion of the student body to enter the longer courses leading to graduation and a degree.

While making some modifications of courses of study as indicated above, it was thought best to slightly advance certain of the requirements for admission. This is particularly true of the department of commercial science where the entrance requirements are made the same as for admission to the regular freshman class of the College. Those in close touch with the work are convinced of the wisdom of the changes, and Professor Crosier, the principal of the department of commercial science, says in his annual report: "I am convinced that the change of requirements has been for the best interest of the individual student."

#### **AGRICULTURAL EDUCATION.**

It is recognized that the primary object of this institution is to provide a practical education along all lines affecting the great agricultural and stock-raising industries of the state. These



interests are fundamental and directly or indirectly concern every citizen. Whatever can be done to promote the development of these great twin industries is sure to win approval and secure support. The Agricultural College is attempting to foster agricultural studies both by enlarging the scope of such work and by encouraging an increasing number of students to pursue agricultural studies and investigations.

That the college is from time to time widening the scope of agricultural studies is shown by the fact that since the last biennial report, two new courses of agricultural study have been added to the curricula, namely, a six weeks course in agriculture offered in mid-winter and intended for practical farmers; and a two years special course in agriculture, intended for those who mean to become practical farmers and live-stock men, but who may not wish to take the full four years course.

That there is an increasing number of students pursuing agricultural studies is seen by the fact that the annual reports of the Registrar of the college show more than twice as many students in agricultural studies for the year 1903-4 as for the year 1902-3.

#### NEW BUILDINGS.

Two new buildings have been completed since the last report: a central heating plant, which cost \$20,100.00, and a barn for the department of agriculture at a cost of \$12,892.00.

#### Students During Year Ended June 30, 1904.

	Male	Female
Preparatory classes .....	116	41
Collegiate classes .....	116	35
Post Graduate courses .....	7	4
Short or Special courses .....	155	45
Number that pursued courses in Agriculture.....		35
Number that pursued courses in Engineering.....		55
Number that pursued courses in Architecture.....		0
Household Economy .....		25
Veterinary Science .....		8
Dairying .....		8
Military Tactics .....		150

	Men	Women
Students graduated during the year.....	20	2
Average age of graduate.....		22

**Degrees Conferred.**

	Men	Women
Master of Science .....	1	
Bachelor of Science .....	9	2
Pharmacy Graduates .....	10	

**Certificates Issued on Completion of Short Courses.**

Agriculture .....	0
Amanuensis .....	3
Art .....	0
Commercial .....	0
Dairy .....	8
Domestic Science .....	0
Music .....	0
Steam Engineers .....	31

**Professors and Instructors During Year Ended June 30, 1904.**

	Male	Female
Preparatory classes .....	3	1
Collegiate and Special classes .....	30	5
	<hr/>	<hr/>
Total .....	33	6
Counted twice .....	2	1
	<hr/>	<hr/>
Total, counting none twice.....	31	5
Number in Experiment Station Staff.....		6

**Value of Additions to Equipment During Year Ended June 30, 1904.**

Buildings .....	\$38,420.00
Library .....	450.00
Apparatus .....	800.00
Machinery .....	7,500.00
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Total .....	\$47,170.00

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**Student Labor During Year Ended June 30, 1904.**

Number of students employed.....	114
Average amount earned by each student.....	\$41.60
Total amount expended for student labor.....	\$4,743.30

**Receipts For and During Year Ended June 30, 1904.**

1. State aid—	
Appropriation for current expenses.....	\$31,500.00
Appropriation for equipment.....	7,500.00
Appropriation for buildings.....	37,000.00
2. Federal aid—	
Morrill Fund (Act of August 30, 1890).....	\$25,000.00
Hatch Fund (Act of March 2, 1887).....	15,000.00
3. Fees and all other sources—	
Tuition fees.....	\$ 2,944.00
Incidental fees.....	2,671.17
Miscellaneous receipts.....	19,789.87
Total .....	<u>\$25,405.04</u>

**Expenditures For and During Year Ended June 30, 1904.**

Instruction (as required by Morrill Act).....	\$ 25,000.00
Instruction in other subjects.....	10,100.00
Administrative expenses, fuel, apparatus, etc.....	45,070.82
For building and repairs.....	41,647.68
For Experiment Station.....	15,333.99
Total .....	<u>\$137,152.49</u>

**Property, Year Ended June 30, 1904.**

Value of all buildings.....	\$195,000.00
Value of apparatus.....	13,000.00
Value of machinery.....	12,000.00
Value of library.....	5,300.00
Value of farm and grounds.....	40,000.00
Value of unsold land.....	800,000.00
Total number of acres in farm and ground.....	400
Total number of acres under cultivation.....	200

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Acres used for experiments.....	80
Number of acres allotted to the College when state was admitted.....	160,000
Number of bound volumes in library.....	7,126
Number of pamphlets in library.....	10,600

I also submit herewith the report of work done in the Agricultural Experiment Station during the year ended June 30, 1904, as required by the rules of the Department of the Interior.

Respectfully submitted,

JAMES CHALMERS,  
President.

ANNUAL REPORT OF THE DIRECTOR OF THE EXPERI-  
MENT STATION FOR THE FISCAL YEAR  
ENDING JUNE 30, 1904.

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*James Chalmers, President South Dakota Agricultural College,*

Sir: I have the honor to submit the following report of the South Dakota Agricultural Experiment Station for the fiscal year ending June 30, 1904.

**THE STAFF.**

With one exception the personnel of the staff remains the same as last year, D. A. Saunders resigning his position as Botanist and Entomologist to engage in private business. W. A. Wheeler of the University of Minnesota, was appointed as his successor.

**THE WORK.**

The lines of investigation and the apportionment of the \$15,000 Hatch Fund were practically the same as for the preceding year. The co-operative work with the United States Department of Agriculture in improving varieties of cereals was continued both at the home Station and the forage-testing Station at Highmore. A co-operative experiment in growing vegetables was undertaken at the home Station. The Department appropriated \$1,400 to defray the expenses involved in these investigations, the only money received by the Station outside the Hatch Fund during the year.

After the resignation of Mr. Saunders the co-operative work with the government in the improvement of cereals was transferred from the division of Botany to that of Agronomy.

Considerable progress has been made through this co-operative work in selection in improving varieties better adapted to this state.

**FINANCIAL STATEMENT.**

The following statement shows how the \$15,000 received under

the provision of the Hatch Act was apportioned for the year:

Salaries .....	\$ 9,340.00
Printing Bulletins .....	1,200.00
Agronomy .....	1,000.00
Horticulture .....	1,000.00
Animal Husbandry .....	885.00
Chemistry .....	500.00
Executive .....	500.00
Botany and Entomology .....	500.00
Veterinary .....	75.00
	<hr/>
	\$15,000.00
State appropriation for Highmore Forage Testing Station .....	1,000.00
Co-operative United States Department of Agriculture Cereal Experiments .....	1,000.00
Co-operative United States Department of Agriculture Vegetable Experiments .....	400.00
	<hr/>
Total for the year.....	\$17,400.00

#### PUBLICATIONS.

Seven bulletins have been issued during the past year numbered from 82 to 88 inclusive on the following subjects: Macaroni Wheat. Its Characteristics and Milling Properties, Millet for Fattening Swine, Report of the Investigation at Highmore for 1903, Early Garden Peas, Fattening Range Lambs, The Western Sand Cherry and Breeding Hardy Fruits. There were also issued two press bulletins on the following subjects: Insects Injurious to Wheat, and Grain Smuts and Their Treatment.

Bulletin No. 82 gives a history of the different varieties of macaroni or durum wheat now known in the United States. There are a great many varieties and some are much better than others. So far as the tests show to date the Kubanka 5639 is by far the best.

This bulletin gives the milling characteristics showing the percentages of bran, shorts and flour for all the varieties. All the wheat and all their different products have been analyzed and a table is given showing the protein and gluten content of each variety.

Another important table shows where the crude protein is distributed. This shows that in the better varieties a larger part of it comes out in the flour.

The manufacture of macaroni is also described and the points of good macaroni are given so that the purchaser may know when he is buying a good product.

A number of recipes are given for cooking macaroni with other substances such as peanuts, cheese, oysters, salmon, etc. A recipe for making macaroni bread is also included. This bulletin will be of value to all lovers of macaroni and its products.

Number 83 contains an account of the feeding tests to determine the relative value to wheat and barley of millet seed as a fattening ration for swine. It shows that the Black Veronezh variety of millet introduced into this state by the United States Department of Agriculture through this Station, can be raised profitably and fed as a grain ration for the production of pork. It is well adapted to the conditions of this state and being easily grown will no doubt be considered one of the principal grains with the stockmen.

Number 84 includes a detailed report of the growth of plants at the Highmore Station in 1903, and shows that many of the recent importations, as a result of the co-operative work which has been carried on for several years at this Station, have found a home in this comparatively dry section of South Dakota.

Number 85 gives the results of observation in the growing and cooking tests of some 80 varieties of early garden peas.

Number 86, Fattening Range Lambs, shows the comparative value of feeding the different rations for the production of mutton. This also draws attention to the necessity of feeding our grains at home, thereby reducing cost in transportation to the minimum. It further shows that millet as a feed for lambs was unexcelled by other grains.

Number 87 includes the results of several years of careful experimentation in improving the native Western Sand Cherry by crossing and selection, and in determining its value as a stock for stone fruits. Announcement is made of some hybrids of the Sand Cherry with larger cultivated fruits such as the apricot and peach.

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Number 88 consists of a preliminary report on breeding hardy fruits to withstand the rigors of our climate. This bulletin is profusely illustrated with photographs showing new methods employed, and some of the new varieties of plums and strawberries originated as a result of this work.

A press bulletin on the insects injurious to wheat, viz: the Hessian-fly, the wheat stem maggot and grain aphid and methods of treatment, was issued during the early part of the fiscal year.

A press bulletin was issued during February, 1904, on Grain Smuts and Their Treatment.

There were 12,000 copies of each bulletin published during the past year, 2,000 more than the previous year. The increasing demand not only from the residents of this state, but from nearly every state in the Union for our bulletins, indicates that the Station's work is popular with the people. The editions of bulletins from 1 to 53, and several of those recently published, are entirely exhausted.

#### DEPARTMENT OF ANIMAL HUSBANDRY.

Since my last report much progress has been made in this division notwithstanding the fact that there has been a comparatively small amount of money, considering the importance of the industry, to work with. Two bulletins appeared during the year, No. 83, Millet for Fattening Swine, and No. 86, Fattening Range Lambs. Other data has accumulated and will be published during the present fiscal year.

The barn provided for by the Legislature two years ago has just been completed. One-third of the floor space in this structure will be utilized for feeding experiments with cattle. With the completion of the barn this Station is as well equipped to conduct feeding experiments with live stock as any state in the Northwest.

The breeding experiment, with the common scrub cow and representatives of each of the leading beef breeds of cattle, outlined in my last report, is well under way. A similar experiment in breeding sheep is planned for the present year.

The following feeding experiments have been outlined for the coming year: Feeding by-products of factories and mills to



swine; Millet as a fattening ration for steers; Value of feeding lambs on rape pasture; Feeding calves on skim milk.

For a more detailed statement of the investigations now under way I refer you to the reports of the chiefs of each division hereto attached.

Respectfully,  
JAMES W. WILSON,  
Director.

**DEPARTMENT OF AGRONOMY.**

*J. W. Wilson, Director.*

SIR: Complying with your request for a report on the work of the Agronomy Department of the Experiment Station for the year ending June 30th, 1904, I submit the following:

The hailstorm that completely destroyed all crops on our experimental grounds last season made it impossible to obtain any results whatever from that year's work at this station.

The work of the present season is largely a duplicate of last season's work and consists of the following lines of work: Crop Rotation which was begun in the spring of 1899, has been carried on continuously and systematically down to the present time and has been fully explained in Bulletin No. 79. The breeding and Selection of Cereals under the centgener system which had been begun by the Department of Botany was transferred to this department in the spring of 1904 and is now fully established and well under way on the experimental grounds of this department. Work in Corn Breeding and Selection, by the single ear and row method, has been enlarged and systematized. The increasing and testing of many varieties of wheat, oats, barley, flax, millet and corn developed by breeding and selection and from various other sources is constantly being extended. For while there is a rigid elimination each year of varieties that have proved unworthy of further trial, there is also a constant increase in the number of promising varieties. Work with winter wheat and rye has been continued with promising results, especially when these grains have been sown between the rows in cornfields. A test of the merits of listing and ordinary planting of corn is under way. The work in Cereal Investigation carried on in co-operation with the Bureau of Plant

Industry is still an important part of our work. This work is conducted both at the home station and at the State station at Highmore and is giving valuable results. A large number of new varieties were obtained from the United States Department of Agriculture at the beginning of the present season and many of the more promising sorts that have been grown during previous seasons have been continued. Some work in Crop Rotation and cultural methods is being carried on at Highmore, as well as at the home station. Laboratory work in the determination of available plant food in soils has been continued during the year.

All of the land available for experimental purposes belonging to the department is being utilized and any further extension of the field work of the department will require more land.

The work in Crop Rotation is proving more and more valuable as the years go by and new problems are constantly presenting themselves which will necessitate a considerable enlargement of the work for next season.

The aforementioned loss of last season's crop made it impossible to issue any bulletins during the past year, except one upon the work at Highmore.

The work of the department was never in more promising condition than at the present time—July 13, 1904—and unless some unforeseen calamity overtakes it the results of the season's work will be valuable. The work has been thoroughly systematized and the assistance rendered by Messrs. Cole, West and Rossman at the home station and Mr. Balz at Highmore has been very efficient and satisfactory.

Respectfully submitted,

E. C. CHILCOTT.

Brookings, S. D., July 14, 1904.

DEPARTMENT OF HORTICULTURE.

*James W. Wilson,*

*Director South Dakota Experiment Station.*

DEAR SIR:

I have the honor to make the following report as Horticulturist of the South Dakota Experiment Station for the fiscal year ending June 30, 1904:

The extensive series of experiments in improving the native fruits of this state are being continued as outlined in my earlier reports. The object of this work is to originate varieties of orchard and small fruits better adapted to the climate than any now known. This plant-breeding is done along two lines, (1) by selection from large numbers of individuals grown under the most favorable environment; (2) by crossing or hybridizing with the best tame varieties, the endeavor being to secure individuals combining the hardiness of the wild with the size and quality of fruit of the tame. The work as a whole may be compared to that of inventing in the mechanical industries.

The number of fruit seedlings last fall reached fully one quarter of a million. Many thousand plants are destroyed each year in process of rigid selection. Some new varieties of the strawberry, sand cherry, gooseberry, plum, raspberry and other fruits resulting from this work are under propagation for distribution for trial elsewhere. For the best results the State should provide for extension of the present limited propagation facilities, especially in the way of greenhouse facilities, so as to hasten the rate of increase of any choice variety which, it should be remembered, must originate from a single seed.

The tract of ten acres of rented land which you as Director assigned to this department was put to good use; seven acres were used last year in plant-breeding nursery and co-operative vegetable work, and by next year it is planned to use the entire ten acres.

In the co-operative work with the United States Department of Agriculture with several hundred varieties of vegetables a good beginning was made, but the hailstorm of July 15 ruined the plats for experimental purposes. The work was continued this season.

During the winter four importations of fruit and ornamental plants were made, one from England, one from France and two from Russia. Several valuable varieties secured are in propagation for trial elsewhere. The underlying principle of this work is that no one country has all the good plants worth having, but that all the plants adapted to northern continental climatic conditions should be obtained for trial.

In the work of breeding hardy double roses some progress was made the past year, over three thousand blossoms of native

single roses from South Dakota and Siberia being crossed with pollen of the best double tame roses. Considerable seed was obtained and the good crop of young plants have been once transplanted this spring.

The need of hardy stocks for the apple to prevent the root-killing so prevalent in the prairie Northwest, was outlined in Bulletin No. 65 of this Station. Since then the experiments in this line have been continued. *Pyrus baccata*, the small fruited crab apple from Siberia, is proving promising as a hardy stock proof against root-killing. Some twenty-two thousand seedlings of this species, raised here from seed imported from Irkutsk, Siberia, were sent out for trial this spring.

The fruiting of our numerous hybrids of the Western Sand Cherry (*Prunus Besseyi*) with choice cultivated fruits, such as Japanese plums, Chinese apricot, peach and nectarine, is awaited with interest. Our work with this promising native cherry up to date is outlined in Bulletin No. 87 of this station. Two other bulletins from this department, No. 85, Early Garden Peas, No. 88, Breeding Hardy Fruits, were issued the latter part of the fiscal year.

More light in horticulture was received by the writer in attending the biennial meeting of the American Pomological Society at Boston September 10-12, and three of the branches of the American Association for the Advancement of Science at St. Louis the last week in December. At the latter meeting the organization of the American Breeders Association was effected; the writer was honored with the secretaryship of the Plant Section.

The steadily increasing correspondence of this Department indicates more general interest in matters horticultural.

N. E. HANSEN,  
Horticulturist.

#### DEPARTMENT OF CHEMISTRY.

*Director James W. Wilson.*

DEAR SIR: In compliance with the law relating thereto I herewith submit a report of the work for the Department of Chemistry in the South Dakota Station for the fiscal year ending June 30, 1904. The work of this Department has been confined

entirely to an investigation of the different wheats grown by this Station. Owing to the fact that hail destroyed the home plats this work has been confined to the wheats grown at the Highmore Range Station.

The samples this year are strictly comparable since they were grown under very advantageous circumstances for macaroni wheat. The conditions prevailing at Highmore are supposed to be ideal conditions for the production of the Durum wheats. For the sake of comparison, however, the best bread wheats obtainable have also been investigated.

In all fifty-one samples have been subjected to investigation. This investigation includes the following points: 1st, their milling qualities in which each sample has been milled quantitatively and the per cent. of flour, bran and shorts has been determined. Also each sample has been milled for semolina to be used in making macaroni. 2nd, The nitrogen has been determined in the whole wheat and the products therefrom, also the dry and wet gluten. The flour from each sample has been baked into bread and from the semolina macaroni has been manufactured. In the case of the breads, the loaf volume and texture and the color have been determined. In order to determine the color of flour, semolina and finished products from each sample, the Department has acquired a Lovibond tintometer in order that the question of color might be established once for all. On the flours, the baker's sponge test has also been made and the time and volume have been accurately determined. A few gliadin determinations have also been made in order to ascertain the cause for the different deportments exhibited by the various samples of wheat.

As will be seen by the brief synopsis preceding, the investigation this year of these new wheats has been made very thorough. In fact our knowledge of them will soon become greater than that of the ordinary bread wheats now commonly grown throughout the States. Owing to the fact that the work of the Department has been concentrated upon one line of investigation the work has been very satisfactory and thorough. A bulletin giving the results of our investigations is now under preparation and will be ready for the press early in the coming year.

Very respectfully,

JAS. H. SHEPARD,  
Chemist.

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**DEPARTMENT OF BOTANY AND ENTOMOLOGY.**

*Mr. James W. Wilson, Director.*

SIR: Complying with your request I submit the following report of the work done by the Department of Botany and Entomology for the fiscal year ending June 30, 1904.

Prof. De Alton Saunders, who has been connected with the department for several years, resigned October 1st, 1903. Because of this change in the head of the department the report of field work for 1903 is somewhat meager. The hail storm of July 15 was also an important factor in lessening results for the year and prevented the harvesting of any of the annual forage plants under trial.

**FORAGE PLANTS.**

The department is at present conducting trials of grasses and forage plants for South Dakota conditions. Much attention is being paid to the Dakota vetch (*Lotus americanus*), it having given promise of being a valuable forage plant if good germination of the seed could be obtained. All plantings of this species prior to 1904 have germinated very poorly, only a few plants being secured each year. The seed for sowing in 1904 was alternately frozen and thawed under the most severe conditions and an almost perfect germination was secured. The problem of germination having been solved the greatest barrier to improvement has been disposed of. Other promising forage plants are also under trial.

A series of red clover plots from seed sent out by the United States Department of Agriculture in 1902 is still continued. The seed was secured from various American and European sources to determine their comparative value. These plots are now in their third year of growth and about half of them are doing very well. On June 30, 1904, the growth on the best plots varied from eighteen to twenty-two inches in height.

Two acres of native prairie sod were disked this year and sown to grasses, clovers, millets and rape to determine the practicability of this method of seeding. Many letters have been received inquiring whether this were practicable or not. This series will be continued for several years and the results published whether positive or negative.



A grass and forage plant nursery has been started in which a few plants of every grass or other plant of possible value for forage are transplanted and if they show any value the seed will be saved and plot trials made.

#### PLANT DISEASES.

The plant diseases to which especial mention should be given are those caused by wheat scab (*Gibberella saubinetii* Sacc.) and the stinking smut of wheat.

Several samples of wheat-scab with inquiries from wheat-growers throughout the southeastern part of the state were received in the fall of 1903. The fungus manifest its presence by the apparent early ripening or whitening of a portion of all of the head. Later the heads turn to a pinkish color and the grain adheres closely to the glumes or chaff of the infected heads. Among the farmers of this vicinity the disease where noticed at all is commonly known as wheat blight. No estimate of the losses sustained during the past year can be made. From the nature of the disease the percentage of loss to a crop is difficult to determine. No remedies are known. The destruction of all infected straw by burning has been advised as a possible preventive. Another stage of the fungus grows upon the dead stems and leaves of several numbers of the grass family including corn, wheat, rye and barley. Little is known concerning the details of the life-history of wheat-scab so very little advice or information can be given concerning it. More will undoubtedly be discovered in the near future.

The stinking smut of wheat was very abundant in 1903 probably because of the specially favorable season for its development. Several machines are now on the market for applying the formaline treatment to seed grain. One of these, the Owens' Smut Cleaner No. 4, was sent to the Experiment Station for trial. It proved to be a very efficient and convenient machine for applying the treatment to grain in large quantities. So many inquiries were received concerning this machine and the treatment of smuts in general that a circular letter was issued in February to all newspapers of the state and to farmers requesting it giving the manner of treating the seed grain for smut and the results of the trial of the Owens' Smut Cleaner.

A series of experiments with vapor treatments for the prevention of stinking smut are being conducted this season, the results of which will probably be published in bulletin form later.

#### INSECTS.

A number of injurious insects have been received with requests for remedies. The stalk borer (*Gortyna nitela* Gu.) has done a considerable amount of damage to herbaceous plants this season. Tomatoes, potatoes, pansies, bachelor's buttons and many other plants have suffered. No remedy could be suggested other than the destruction of infected parts to prevent the further distribution of the pest.

The cottony scale (*Pulvinaria innumerabilis* Rathv.) was found plentifully on maples at Centerville, South Dakota. To what extent it is present in the state is not known.

Other injurious insects have been noted from time to time but none has been unusually prevalent.

#### HIGHMORE.

During the season of 1903 a large number of annual forage plants were tested at the Highmore station. The results of these trials have been published in bulletin number 84 of this station.

All of the old grass plots had become over-run with squirrel-tail grass and were plowed up in the fall of 1903. A series of 210 plots of one square rod each were planted this spring to numerous grasses, clovers and other forage plants. It is intended that a series of this kind shall be planted every year gradually weeding out the undesirable kinds and adding new kinds.

In this series are a large number of plots of *Bromus inermis*, the seed of which was obtained by sending to all the seedsmen in neighboring states and to several seedsmen in other states and foreign countries. A great many letters have come from growers of *Bromus inermis* complaining that there were several varieties, some good and some poor, and that the seed could not be depended upon. It was therefore considered desirable to sow seed from a large number of sources for comparison.

A grass nursery has been started at Highmore to be carried along in the same manner as the one at Brookings. A trip is to



be made along the Cheyenne river in July of this season to secure grasses for trial at the Highmore Station.

A seed house is very badly needed at Highmore for storing and handling seeds and plants. The present facilities are entirely inadequate for the work of the station.

During the current year special attention will be given to the testing and improvement of grasses and forage plants both at Brookings and at Highmore.

Respectfully submitted,

W. A. WHEELER.

**DEPARTMENT OF VETERINARY.**

*To the Director of the South Dakota Experiment Station,*

Sir: I have the honor to submit the following as a summary of the year's work in the Veterinary Department.

Investigations on sheep affected with tapeworms have been continued and with encouraging results. Further observations must be made, however, before conclusions can be drawn.

Experiments on the use of various sheep dips are to be continued.

Results obtained in the treatment of azoturia in the horse will later be ready for publication.

The effect of continued and increasing injections of mallein on horses re-acting to glanders is also under observation.

Respectfully submitted,

E. L. MOORE, D. V. S.